

This Page Is Inserted by IFW Operations  
and is not a part of the Official Record

## **BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning documents *will not* correct images,  
please do not report the images to the  
Image Problem Mailbox.**



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>6</sup> : A47C 21/00	A1	(11) International Publication Number: <b>WO 98/17153</b>
		(43) International Publication Date: 30 April 1998 (30.04.98)

(21) International Application Number: PCT/US97/19177

(22) International Filing Date: 20 October 1997 (20.10.97)

## (30) Priority Data:

08/735,510	23 October 1996 (23.10.96)	US
08/747,318	12 November 1996 (12.11.96)	US

(71) Applicant: HILL-ROM, INC. [US/US]; 1069 State Route 46 East, Batesville, IN 47006 (US).

(72) Inventors: CORBIN, Scott, M.; 9570 E. North Dearborn Road, Sunman, IN 47041 (US). MOSTER, Jeffrey, A.; 572 Covedale Avenue, Cincinnati, OH 45238 (US). WILSON, Robert, W.; 27 White Oak Drive, Batesville, IN 47006 (US). MILLER, John, D.; 2171 Morgan Road, Brookville, IN 47012 (US). WEBSTER, Thomas, Matthew; Apartment 249, 8186 West Mill Street, Cleves, OH 46002 (US). WALKE, James, L.; 222 North Depot Street, Batesville, IN 47006 (US). HOWELL, Charles, A.; 106 White Oak Drive, Batesville, IN 47006 (US).

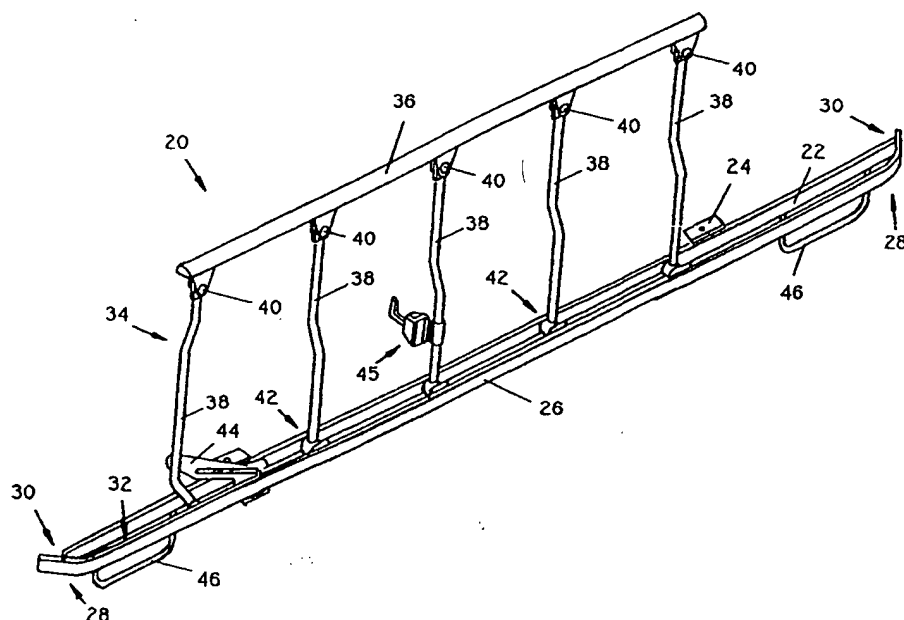
(74) Agent: COFFEY, William, R.; Barnes &amp; Thornburg, 11 South Meridian Street, Indianapolis, IN 46204 (US).

(81) Designated States: European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).

## Published

With international search report.

(54) Title: INTEGRATED SIDERAIL AND ACCESSORY RAIL FOR A BED



## (57) Abstract

A rail apparatus (20) is configured to be mounted to a frame (14) of a bed (10). The apparatus (20) includes a siderail (36), a support (38) having a first end (46) pivotally coupled to the siderail (36) and a second end, and a bottom mounting (22, 42) pivotally coupled to the second end of the support (38). The bottom mounting (22, 42) includes at least one mounting bracket (24) for coupling the bottom mounting (22, 42) to the frame (14) of the bed (10), and an accessory rail (26) configured to permit mounting of accessory items (60) on the rail apparatus (20).

*FOR THE PURPOSES OF INFORMATION ONLY*

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece			TR	Turkey
BG	Bulgaria	HU	Hungary	ML	Mali	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MN	Mongolia	UA	Ukraine
BR	Brazil	IL	Israel	MR	Mauritania	UG	Uganda
BY	Belarus	IS	Iceland	MW	Malawi	US	United States of America
CA	Canada	IT	Italy	MX	Mexico	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NE	Niger	VN	Viet Nam
CG	Congo	KE	Kenya	NL	Netherlands	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NO	Norway	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	NZ	New Zealand		
CM	Cameroon			PL	Poland		
CN	China	KR	Republic of Korea	PT	Portugal		
CU	Cuba	KZ	Kazakstan	RO	Romania		
CZ	Czech Republic	LC	Saint Lucia	RU	Russian Federation		
DE	Germany	LI	Liechtenstein	SD	Sudan		
DK	Denmark	LK	Sri Lanka	SE	Sweden		
EE	Estonia	LR	Liberia	SG	Singapore		

## INTEGRATED SIDERAIL AND ACCESSORY RAIL FOR A BED

### Background and Summary of the Invention

The present invention relates to an improved accessory attachment  
5 apparatus for use in a hospital room, nursing home, or other medical facility. More particularly, the present invention relates to an improved accessory bar or rail configured to be mounted on a bed to permit attachment of desired accessory items to the rail.

It is known to use accessory rails mounted on a wall of a hospital room or  
to a frame of a hospital bed for supporting various accessory items. Accessory items are  
10 typically mounted to these accessory rails using known clamps. In addition, items can be hung from the accessory rails.

Problems are associated with the use of such conventional accessory rails,  
especially when the rails are mounted on a hospital bed. First, the accessory rails may  
block the use of other items, such as siderails or barriers used to help keep a patient in the  
15 bed. Second, such known accessory rails attached to the bed frame can be difficult to clean. Fasteners that are used to secure the accessory rails to the bed provide areas that can collect dirt or other contaminants.

Therefore, it is desirable to provide an accessory rail on the bed which  
does not interfere with any moving components of the bed or with operation of the  
20 siderail of the bed. In addition, the accessory rail should be easy to clean for use in a medical environment.

The present invention provides such an accessory rail integral with the  
siderail barrier of the bed. The improved structure of the present invention permits the  
use of any length siderail with an accessory rail. The accessory rail is incorporated into a  
25 bottom or lower weldment of the siderail assembly. The accessory rail of the present invention also acts as a perimeter bumper and provides a near zero transfer gap to facilitate moving a patient from the bed.

Since the accessory rail of the present invention is part of the siderail  
barrier assembly, it does not interfere with operation of any moving components of the  
30 bed or siderail. The entire accessory rail is preferably coated with a nylon based finish to provide a scratch resistant outer surface. The color of the finish can be selected to match the bed frame color so that the accessory rail is aesthetically appealing.

According to one aspect of the present invention, a rail apparatus is configured to be mounted to a frame of a bed. The apparatus includes a siderail, a support having a first end pivotably coupled to the siderail and a second end, and a bottom mounting pivotably coupled to the second end of the support. The bottom  
5 mounting including at least one mounting bracket for coupling the bottom mounting to the frame of the bed, and an accessory rail configured to permit mounting of accessory items on the rail apparatus.

According to another aspect of the present invention, a rail apparatus is configured to be mounted to a frame of a bed. The apparatus includes an elongated  
10 mounting rail, at least one mounting bracket for coupling the mounting rail to the frame, and an accessory rail coupled to the mounting rail. The accessory rail is configured to receive accessory items. The apparatus also includes a siderail having a plurality of tubes and a top rail. Each tube has a first end coupled to the top rail and a second end coupled between the mounting rail and the accessory rail.

15 In the illustrated embodiment, the accessory rail has a length which is longer than a length of the top rail of the siderail so that accessory rail extends beyond the siderail to facilitate mounting of accessory items to the accessory rail. The accessory rail extends beyond at least a first end of the siderail. Also in the illustrated embodiment, the accessory rail extends along substantially a full length of a side of the bed. The accessory  
20 rail includes first and second ends which are curved inwardly toward the mounting rail. The first and second curved ends of the accessory rail are welded or otherwise fastened to the mounting rail in the illustrated embodiment.

The illustrated accessory rail has a rectangular cross sectional shape and is covered with a scratch resistant coating. A drain bag holder is coupled to the mounting  
25 bracket.

In the illustrated embodiment, the first end each tube is pivotably coupled to the top rail and the second end of each tube is pivotably coupled between the mounting rail and the accessory rail so that the siderail is pivotable between an upright barrier position and a collapsed storage position. The second end of each tube is coupled to a  
30 bushing. Each bushing is pivotably coupled between the mounting rail and the accessory rail by a fastener. A spacer block is coupled between the bushing and one of the mounting rail and the accessory rail by the fastener.

Additional objects, features, and advantages of the invention will become apparent to those skilled in the art upon consideration of the following detailed description of the preferred embodiment exemplifying the best mode of carrying out the invention as presently perceived.

5

#### Brief Description of the Drawings

Fig. 1 is a perspective view illustrating an integrated siderail and accessory rail assembly mounted on each side of a stretcher or bed;

Fig. 2 is a perspective view illustrating details of the integrated siderail and accessory rail assembly of the present invention;

10

Fig. 3 is a sectional view taken along lines 3-3 of Fig. 1 illustrating mounting of the siderail and accessory rail assembly to a frame member of the bed; and

Fig. 4 is a sectional view taken along lines 4-4 of Fig. 1 illustrating connection of an accessory item to the accessory rail using a suitable clamp.

15

#### Detailed Description of the Drawings

Referring now to the drawings, Fig. 1 illustrates a bed 10 having a base 12 and a frame 14 coupled to the base 12. A deck 16 is coupled to the frame 14, and a patient support surface 18 is located on the deck 16. Although a stretcher-type bed 10 is illustrated in Fig. 1, it is understood that any type of bed can be used in accordance with the present invention. The deck 16 may be an articulating deck which moves relative to the frame 14 in a conventional manner.

20

An integrated rail assembly 20 of the present invention is mounted to opposite sides of the bed 10 to extend parallel to a longitudinal axis 21 of the bed 10.

The rail assembly 20 is best illustrated in Fig. 2. The rail assembly 20 includes a straight mounting rail 22 having a length substantially equal to a length of the bed 10. Spaced apart mounting brackets 24 are coupled to the mounting rail 22 for securing the rail assembly 20 to the bed 10 as discussed in detail below.

25

Rail assembly 20 further includes an outer accessory rail 26 for coupling various accessory items to the rail assembly 20 as discussed below. Illustratively, rails 22 and 26 are made from an extruded aluminum material. Preferably, accessory rail 26 has inwardly bent or curved end portions 28 which are welded to opposite ends of the

30

mounting rail 22 at locations 30. Therefore, a space or gap 32 is provided between the mounting rail 22 and the accessory rail 26.

A siderail assembly 34 for the bed 10 is coupled between the mounting rail 22 and the accessory rail 26. Siderail assembly 34 includes a top rail 36 pivotably coupled to top ends of siderail tubes 38 by pivot connections 40. Opposite, bottom ends of the tubes 38 are pivotably coupled between the mounting rail 22 and the accessory rail 26 by lower pivot connections 42 as discussed below. A latch plate 44 is coupled between an end tube 38 and the mounting rail 22 and accessory rail 26 to hold the siderail assembly 34 in an upright position illustrated in Fig. 2. U-shaped drain bag holders 46 are coupled to opposite ends of mounting rail 22. A stop 45 is coupled to one tube 38 for engaging frame 14 when siderail 20 is in the upwardly pivoted in use position of Fig. 2.

Preferably, the entire rail assembly 20 is coated with a Nylon-based finish to provide a scratch resistant outer surface. After the mounting rail 22 and the accessory rail 26 are welded together, the rails 22 and 26 are preferably dipped into a bath to provide the Nylon based finish. It is understood that another type of scratch resistant surface can be used, if desired. The color of the finish can be selected to match the color of the base 12 of frame 14 of bed 10. In addition, the accessory rail may be formed from stainless steel, or made from an injection molded plastic material or other suitable material.

Details of the connection of the rail assembly 20 to the bed 10 are illustrated in Fig. 3. The mounting brackets 24 are illustratively U-shaped to fit over a frame member 48 of bed 10. Mounting brackets 24 are secured to frame member 48 by suitable fasteners 50. Frame member 48 may be a swing arm pivotably coupled to the bed 10, if desired. Other suitable fasteners such as a clamping device may be used instead of brackets 24.

Also as illustrated in Fig. 3, each tube 38 of siderail 34 extends into a rotatable bushing 52 which is connected between mounting rail 22 and accessory rail 26 by a suitable fastener 54. Wave washers 56 are located on opposite sides of bushing 52. A spacer block 58 is located between bushing 52 and accessory rail 26. Therefore, siderail 34 can pivot from an upwardly pivoted barrier position shown on one side of the bed 10 in Fig. 1 and in Fig. 2 to a downwardly pivoted, storage position shown on an opposite side of the bed 10 in Fig. 1.

After the rail assembly 20 is coupled to the bed, the siderails 34 can function in a conventional manner. The accessory rail 26 permits accessory items such as item 60 in Fig. 1 to be mounted to the accessory rail 26. Illustratively, a clamp 62 is used to secure the accessory item 60 to the accessory rail 26. Clamp 62 includes a C-shaped  
5 body 64 for receiving a support post 66. A threaded actuator 68 is rotatable to secure the clamp 62 to the accessory rail 26. Illustratively, the accessory rail 26 may be a 10mm x 25mm rail to accept standard European clamp sizes.

It is understood that any type of accessory item can be coupled to the accessory rail with a similar clamp. It is also understood that accessory items may include  
10 hooks or other means for coupling the items directly to the accessory rail 26 without the need for clamp 62.

Since accessory rail 26 is integral with siderail 34, the accessory rail 26 does not interfere with any moving components of the bed 10 or the siderail 34. The integral rail assembly 20 of the present invention therefore permits the accessory rail 26 to  
15 be used with a any length siderail 34. As shown in Fig. 1, the accessory rail 26 extends substantially the entire length of bed 10. Therefore, the accessory rail 26 provides a perimeter bumper for the sides of bed 10. In addition, the accessory rail 26 does not require any exposed screws or fasteners for mounting. This improves cleanability of the accessory rail 26.

20 It is further understood that other types of support mechanisms can be used for the siderail. In certain instances, other pivoting arrangements may be used to secure the siderail to a bottom mounting including the mounting rail 22 and accessory rail 26. See, for example, U.S. Patent No. 2,722,017 or 5,129,117.

Although the invention has been described in detail with reference to a  
25 certain preferred embodiment, variations and modifications exist within the scope and spirit of the present invention as described and defined in the following claims.



CLAIMS:

1. A rail apparatus configured to be mounted to a frame of a bed, the apparatus comprising:
  - 5 an elongated mounting rail;
  - at least one mounting bracket for coupling the mounting rail to the frame;
  - an accessory rail coupled to the mounting rail, the accessory rail being configured to receive accessory items;
  - a siderail including a plurality of tubes and a top rail, each tube having a first end coupled to the top rail and a second end coupled between the mounting rail and the accessory rail; and
  - 10 a spacer block between the pivotal coupling of the second end and the accessory rail of a sufficient width to permit mounting of accessory items to the accessory rail adjacent the siderail without interfering with pivoting of the siderail.
- 15 2. The apparatus of claim 1, wherein the accessory rail has a length which is longer than a length of the top rail of the siderail so that accessory rail extends beyond the siderail to facilitate mounting of accessory items to the accessory rail.
3. The apparatus of claim 1, wherein the accessory rail extends beyond at least a first end of the siderail.
- 20 4. The apparatus of claim 1, wherein the accessory rail extends along substantially a full length of a side of the bed to provide a perimeter bumper for the bed.
5. The apparatus of claim 1, wherein the accessory rail includes first and second ends which are curved inwardly toward the mounting rail.
6. The apparatus of claim 5, wherein the first and second curved ends of the accessory rail are welded to the mounting rail.
- 25 7. The apparatus of claim 1, wherein the accessory rail has a rectangular cross sectional shape.
8. The apparatus of claim 1, wherein the accessory rail is covered with a scratch resistant coating.
- 30 9. The apparatus of claim 1, further comprising a drain bag holder coupled to the mounting bracket.

10. The apparatus of claim 1, wherein the first end each tube is pivotably coupled to the top rail and the second end of each tube is pivotably coupled between the mounting rail and the accessory rail so that the siderail is pivotable between an upright barrier position and a collapsed storage position.
- 5 11. The apparatus of claim 1, wherein the second end of each tube is coupled to a bushing, each bushing being pivotably coupled between the mounting rail and the accessory rail by a fastener.
12. The apparatus of claim 11, wherein the spacer block is coupled between the bushing and the accessory rail by the fastener.
- 10 13. A rail apparatus configured to be mounted to a frame of a bed, the apparatus comprising a siderail, a support having a first end pivotably coupled to the siderail and a second end, and a bottom mounting pivotably coupled to the second end of the support, the bottom mounting including at least one mounting bracket for coupling the bottom mounting to the frame of the bed, and an accessory rail configured and
- 15 coupled to the bottom mounting by a spacer of sufficient width to permit mounting of accessory items on the rail apparatus adjacent the siderail without interfering with pivoting of the siderail.
14. The apparatus of claim 13, wherein the support includes a plurality of tubes, each tube having a first end pivotably coupled to the siderail and a second end
- 20 pivotably coupled to the bottom mounting so that the siderail is pivotable between an upright barrier position and a collapsed storage position.
15. The apparatus of claim 13, wherein the accessory rail has a length which is longer than a length of the siderail so that accessory rail extends beyond the siderail to facilitate mounting of accessory items to the accessory rail.
- 25 16. The apparatus of claim 13, wherein the accessory rail extends along substantially a full length of a side of the bed to provide a perimeter bumper for the bed.
17. The apparatus of claim 13, wherein the bottom mounting includes an elongated mounting rail and at least one mounting bracket for coupling the mounting
- 30 rail to the frame of the bed, the accessory rail including first and second ends which are curved inwardly toward and coupled to the mounting rail.

-8-

18. The apparatus of claim 13, wherein the accessory rail has a rectangular cross sectional shape.

19. The apparatus of claim 13, wherein the accessory rail is covered with a scratch resistant coating.

5           20. The apparatus of claim 13, wherein the accessory rail extends beyond at least a first end of the siderail.

21. A rail apparatus configured to be mounted to a frame of a bed, the apparatus comprising:

10           an elongated mounting rail;  
            at least one mounting bracket for coupling the mounting rail to the frame;  
            an accessory rail coupled to the mounting rail and being configured to receive accessory items;

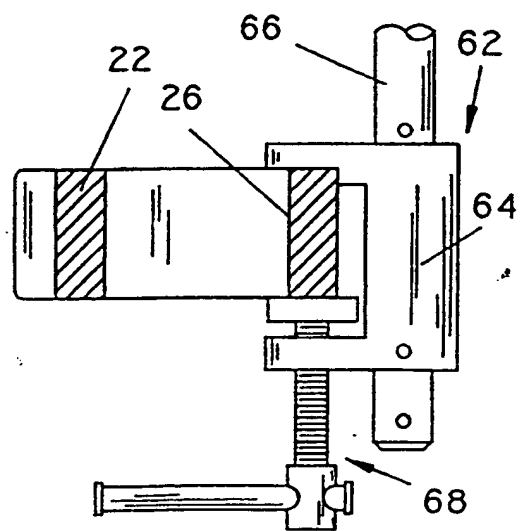
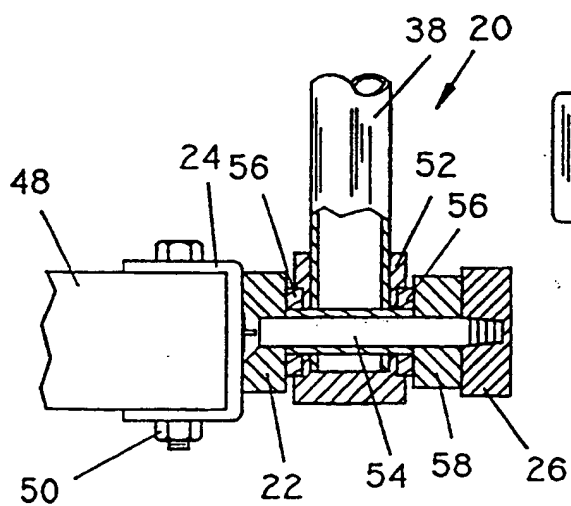
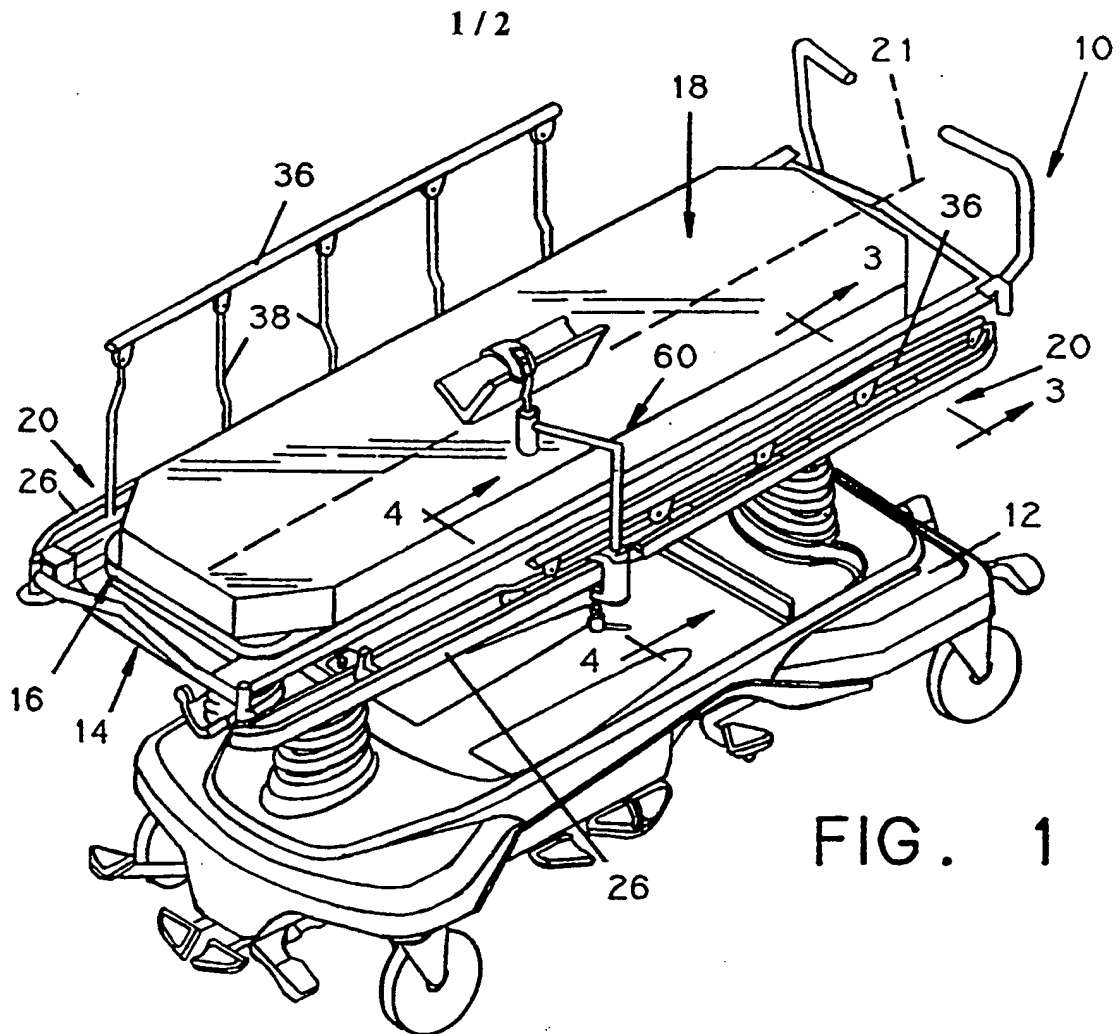
            the accessory rail includes first and second ends which are curved inwardly toward the mounting rail and extends along substantially a full length of a side of the bed  
15           to provide a perimeter bumper for the bed; and

            a siderail pivotally coupled between the mounting rail and the accessory rail.

22. The apparatus of claim 1, including a clamp mounting an accessory item to the accessory rail.

20           23. A rail apparatus configured to be mounted to a frame of a bed, the apparatus comprising:

            an elongated mounting rail;  
            at least one mounting bracket for coupling the mounting rail to the frame;  
            an accessory rail coextensive with and coupled to the mounting rail at their  
25           respective ends and being configured to receive accessory items; and  
            a siderail pivotally coupled between the mounting rail and the accessory rail.



2 / 2

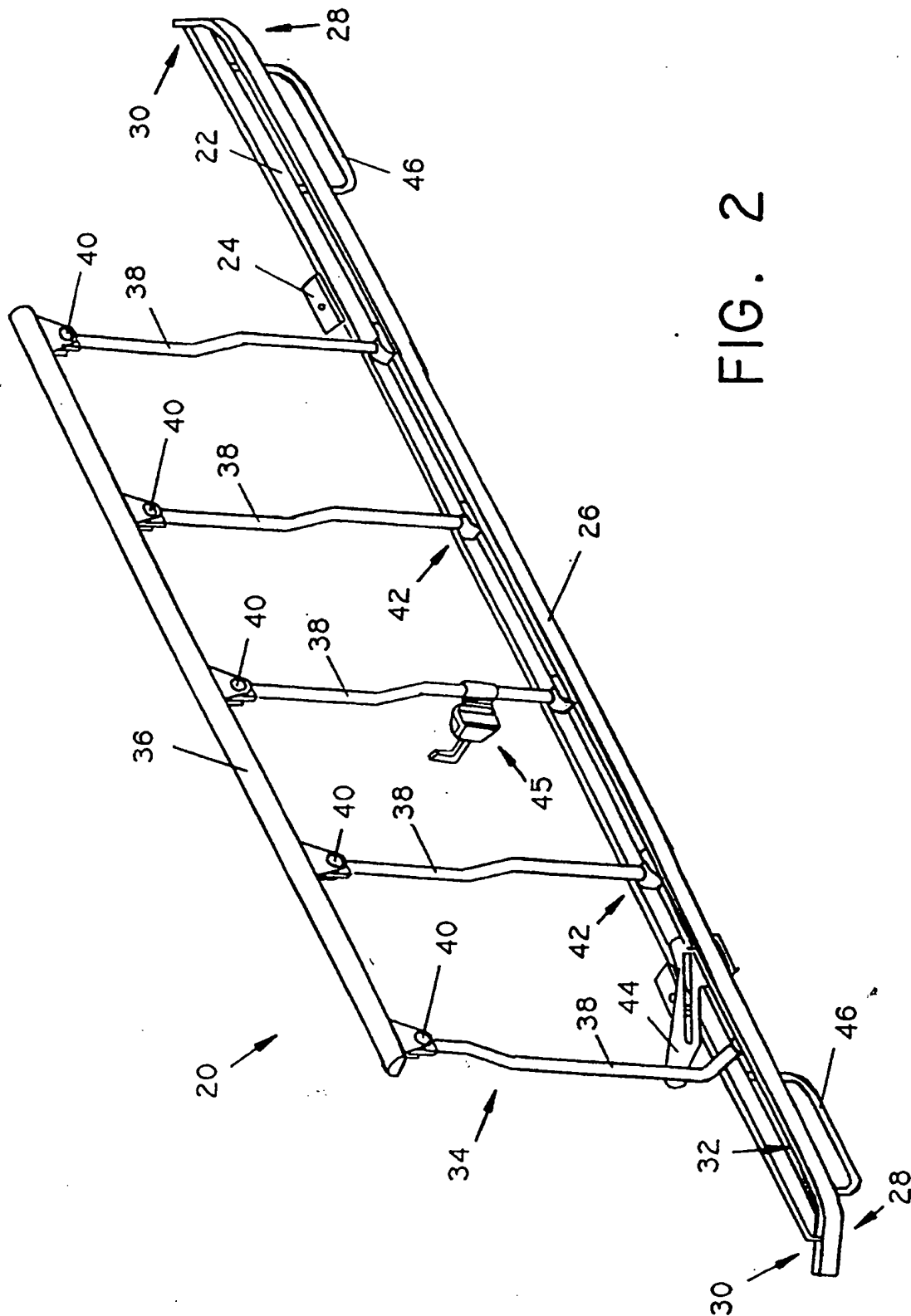


FIG. 2

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US97/19177

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :A47C 21/00

US CL :5/425

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 5/425, 424, 503.1, 507.1 658,

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,038,430 A (BLY) 13 August 1991 (13/08/91), see entire document, especially figure 1.	1-9 and 13-23
Y	US 4,949,410 A (FAILOR ET AL) 21 August 1990 (21/08/90), see entire document, especially figure 11.	1-9 and 13-23
Y	US 5,407,163 (KRAMER ET AL) 18 August 1995 (18/08/95), see entire document, especially figures 1-3.	1-9 and 13-23
Y	US 5,499,721 (HANSEN ET AL) 19 March 1996 (19/03/96), see entire document, especially figures 1-2.	5-6 and 17

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
*A* document defining the general state of the art which is not considered to be of particular relevance	*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
*B* earlier document published on or after the international filing date	*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
*L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*A* document member of the same patent family
*O* document referring to an oral disclosure, use, exhibition or other means	
*P* document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 07 DECEMBER 1997	Date of mailing of the international search report 12 JAN 1998
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer FREDRICK CONLEY Telephone No. (703) 308-7468

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US97/19177

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 53956,540 A (LALILBERTE ET AL) 11 May 1976 (11/05/76), see entire document, especially column 1-2, line 45-68 and 1-14.	8 and 19